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10/695,246	10/27/2003	Gillray L. Kandel	0200.002.01/US	4321
41894 FIELDS IP, PS P.O. BOX 327 BINGEN, WA 98605	7590 07/08/2009		<div>EXAMINER</div> <div>KOVACEK, DAVID M</div>	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/695,246

Applicant(s)

KANDEL ET AL.

Examiner

David Kovacek

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SF/ICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

1. This Office Action is response to applicant's Amendment, filed 03/05/2009, in which the applicant amends **claims 1-2, 6-8 and 13-14**, and provides arguments for patentability over the previously cited prior art.

Response to Amendment

2. The applicant's amendments to the claims have been considered and are accepted. It is noted by the examiner that formal acceptance of the conditions of the claims is not an indication of allowability of the claims over the prior art. Appropriate rejections are included in this Office Action in the relevant sections below. It is noted by the examiner that the current amendments substantially change the scope of the limitations of the claims as previously presented. It is noted by the examiner that formal acceptance of the conditions of the claims is not an indication of allowability of the claims over the prior art. Appropriate rejections are included in this Office Action in the relevant sections below.

3. The applicant's amendments to **claim 8** with respect to the previous rejection of the same under 35 USC §112, Second Paragraph have been considered and are accepted. Accordingly, the previous rejection of **claim 8** under 35 USC §112, Second Paragraph is withdrawn.

Response to Arguments

4. It is noted by the examiner that the header information provided in the amendment of this application appears to cite incorrect reference data. However, the contents of the amendment appear to be correctly addressing the issues of prosecution for the instant application 10/695,246. The heading information has not been considered for the purposes of examination.

5. Applicant's arguments with respect to the previous rejections under 35 USC §103(a) have been considered but are moot in view of the new ground(s) of rejection.

Certain arguments presented by the applicant remain relevant in view of the new grounds of rejection, and are addressed below.

Specifically, the applicant argues that the teachings of Fletcher (*Acoustic Systems in Biology*, Oxford University Press: 1992; cited previously) are not sufficient to appropriately teach, suggest, or render obvious the limitation of emulation of one or more of an individual's ear cupping and an ear trumpet aid.

In particular, the applicant contends that "applicant finds no teaching, disclosure or suggestion within Fletcher that the passive solutions of ear cupping or employment of ear

trumpets might likewise provide qualities that might be capable of emulation for enhancing speech intelligibility (Remarks of 03/05/2009: Page 12, paragraph 02)."

The applicant further argues that "an artisan that may have the various cited references before them, and not cognizant of applicant's disclosure, would not be informed of the solution provided by applicant... [none of the references, including Fletcher] teach of hand ear cupping, ear trumpet or of associated benefits to speech intelligibility via first and second speech formant frequencies [emphasis in original] (Remarks of 03/05/2009: Page 13, paragraph 03)."

The examiner first notes that the standard of knowledge is not what would "an artisan" be "informed" of, but instead must be applied to what is known to one of *ordinary skill* in the art at the time the invention was made. The examiner contends that one of ordinary skill in the art would, in view of the references, be explicitly taught by Fletcher how to achieve an emulation of a horn shape (such as that of an ear trumpet) for the purpose of providing an approximation of the response of the human ear. The examiner further contends that it would have been known to one of ordinary skill in the art that the human ear is an excellent design, in nature, for hearing human speech. Such teachings were in fact present in the art at the time the invention was made, illustrated by the report in September 2002 that improvements to speech recognition could be made by purposefully pursuing technology that mimics the behavior of the human ear (see *Speech Technology Magazine* reference, cited with this Office Action).

The examiner further contends that the teachings of Fletcher independently suggest the usage of a horn/trumpet-type shape as a good emphasis filter for human hearing (pp. 186-187).

The applicant has further contested that one of ordinary skill in the art at the time the invention was made would not have been cognizant of such a feature in view of Fletcher without further knowledge of the applicant's invention. However, the applicant has provided no further objective evidence, rationale, or arguments to invalidate the examiner's previous reasoning to show the motivation for one of ordinary skill in the art to use the teachings of Fletcher in just such a manner. Applicant's arguments with respect to this limitation and the teachings of Fletcher fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

Claim Objections

6. **Claim 1** is objected to because of the following informalities:

- The third limitation of **claim 1** should instead read: the amplification of the first frequency range being different from the amplification of the second frequency range and

emulating [[to emulate]] at least one property of a
passive device...

Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Claims 1 and 6** are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,459,813, hereinafter referred to as Klayman.

Regarding **claim 1**, Klayman discloses a speech-dedicated amplifying system to increase speech intelligibility [public address system]
(Abstract; Col. 2, lines 15-21) comprising:

- a first amplifying circuit to linearly amplify a first frequency range of an audio signal that substantially comprises first speech formant frequencies [output lines

each of a narrow frequency band being processed independently] (Fig. 3, elements 50, 74; Col. 4, line 65 – Col. 5, line 07; Col. 5, lines 14-24);

- a second amplifying circuit to linearly amplify a second frequency range of the audio signal that substantially comprises second speech formant frequencies [output lines each of a narrow frequency band being processed independently] (Fig. 3, elements 58, 80; Col. 4, lines 50-52; Col. 5, lines 03-07, lines 14-24);
- the amplification of the first frequency range being different from the amplification of the second frequency range [different frequency components appear on different output lines] (Fig. 3, elements 44, 46; Col. 54, lines 57-60) and
- emulating at least one acoustic property of a passive device of a spectral emphasis for the second speech formant frequencies relative to the first speech formant so as to enhance speech intelligibility [a method of enhancing speech intelligibility...amplifying individual ones of said formants of said spoken words by controlled amounts;] (Fig. 2; Col. 3, lines 25-36; Claim 1);
- a mixer to combine the first frequency range and the second frequency range into an amplified audio signal

[mixer 108 to combine signals] (Fig. 3, element 108; Col. 5, lines 54-63);

and

- an acoustic output device to transmit the amplified audio signal [speaker in public address system; output line] (Fig. 1, element 16; Fig. 3, element 116; Col. 2, lines 39-43; Col. 5, lines 63-64).

Regarding **claim 6**, this claim is very similar to **claim 1** and is rejected for the same reasons. **Claim 6** corresponds to **claim 1** since they are related as the apparatus and method of using the apparatus, and hence are rejected for the same reasons as given above.

Claim Rejections - 35 USC § 103

9. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

10. **Claims 8 and 10-13** are rejected under 35 U.S.C. 103(a) as being unpatentable over Klayman in view of Miller (US Patent 5,506,910; listed in the applicant's IDS).

Regarding **claim 8**, Klayman discloses a method of enhancing speech intelligibility in a public address system (Abstract; Col. 2, lines 15-21) comprising:

- receiving an audio signal [voice source] (Fig. 1, element 10; Col. 2, lines 15-21);
- amplifying a first frequency range of the audio signal received that substantially consists of first speech formant frequencies [output lines each of a narrow frequency band being processed independently] (Fig. 3, elements 50, 74; Col. 4, line 65 – Col. 5, line 07; Col. 5, lines 14-24); and
- amplifying a second frequency range of the audio signal received that substantially consists of second formant frequencies of the audio signal [output lines each of a narrow frequency band being processed independently] (Fig. 3, elements 58, 80; Col. 4, lines 50-52; Col. 5, lines 03-07, lines 14-24),
- the amplifying of the second frequency range performed differently from the amplifying of the first frequency range to lend emphasis of the second formant frequencies for speech intelligibility [an apparatus for enhancing speech intelligibility...amplifying individual ones of said formants of said spoken words by controlled amounts;] (Fig. 2; Col. 3, lines 25-36; Claims 13-14);

Miller discloses a method of enhancing speech [audio] in a public address system, comprising:

- receiving an audio signal (Fig. 1, elements 24, 26, 28, 30, 70; Col. 3, lines 38-42; Col. 5, line 67 – Col. 6, line 03);
- differentially amplifying a first frequency range...and a second frequency range (Fig. 1, elements 20, 32; Fig. 3, element 20; Col. 4, lines 21-30);

It is noted by the examiner that though Miller does not explicitly disclose the differentiation between frequency ranges as relating directly to speech formant frequencies, the multigrain control unit is directed to the full range of human auditory frequencies, which necessarily includes ranges that comprise the frequency ranges related to the first and second formants of human speech.

- mixing an injected inaudible signal tone [masked sine wave] with the audio signal (Fig. 1, element 22; Col. 2, lines 33-38, lines 46-47; Col. 4, lines 64-67);
- sensing a level of the signal tone within the audio signal received (Fig. 1, element 42; Col. 3, lines 49-52); and
- controlling a gain for the amplifying of the second frequency range based on the level of the signal tone sensed (Fig. 1, element 44; Col. 3, line 67 – Col. 4, line 06);
- the controlling the gain for the amplification to be based on the level sensed (Col. 3, lines 54-60; Col. 4, lines 21-25),

- to substantially prevent regenerative oscillation [unwanted acoustic feedback/howl] of the audio signal (Fig. 3, element 62; Col. 7, lines 09-16) and
- to amplify the second formant frequencies without creating howling (Col. 3, lines 54-60; Col. 7, lines 54-60).

The references are combinable because each is directed to enhancing an audio signal in a loudspeaker system using multiple narrowband filters. Miller further provides motivation to combine the references in disclosing the utility of inserting reference signals into output audio for detection in order to provide a reliable standard in analyzing the performance of said loudspeaker system (Col. 2, lines 33-45).

Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Klayman and Miller in order to enhance audio signals in a loudspeaker system using multiple narrowband filters that is further operable to insert reference signals into the output audio for detection in order to provide a reliable standard in analyzing the performance of said loudspeaker system.

Regarding **claim 10**, Klayman in view of Miller discloses or renders obvious all limitations of **claim 8** as applied above, and Miller further discloses that the sensing of the signal tone makes use of a narrow band filter (Fig. 1, element 42; Col. 5, lines 04-11, lines 30-39).

This limitation is **directly** related to the teachings of Miller as applied above to the limitations of **claim 8**, and therefore the motivation to combine the references is the same for **claim 10** as applied above to **claim 8**.

Regarding **claim 11**, Klayman in view of Miller discloses or renders obvious all limitations of **claim 8** as applied above, and Miller further discloses sensing a change in at least one environmental variable (Col. 4, lines 54-60; Col. 4, line 67 - Col. 5, line 06; Col. 5, lines 39-47), and further implies the controlling the gain for the amplification is further based on the sensed change (Col. 3, line 64 – Col. 4, line 10; Col. 4, lines 54-63).

The limitations of **claim 11** are directly related to the teachings of Miller as applied above to **claim 8**. Therefore, the motivation to combine the references is the same for **claim 11** as applied above to **claim 8**.

Regarding **claim 12**, Klayman in view of Miller discloses or renders obvious all limitations of **claim 11** as applied above, and Miller further implies that the sensed change is based on the signal tone (Col. 3, lines 54-60; Col. 3, line 64 – Col. 4, line 10).

The limitations of **claim 12** are directly related to the teachings of Miller as applied above to **claim 11**. Therefore, the motivation to combine the references is the same for **claim 12** as applied above to **claim 11**.

Regarding **claim 13**, Klayman in view of Miller discloses or renders obvious all limitations of **claim 8** as applied above, and Miller further discloses suggests that the differentially amplifying emulates at least one acoustic property of a passive device [desired frequency response, such as room compensation] (Fig. 2; Col. 3, lines 61-64; Col. 3, line 64 - Col. 4, line 10).

The references are combinable because each is directed to enhancing an audio signal in a loudspeaker system using multiple narrowband filters. Miller further provides motivation to combine the references in disclosing the utility of improved equalization for the purpose of adjusting the tonality of a broadcast to prevent distortion caused by playback in a room with an undesirable frequency response (Col. 2, lines 25-32; Col. 3, lines 61-67).

Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Klayman and Miller in order to enhance audio signals in a loudspeaker system using multiple narrowband filters that is further operable to utilize improved equalization for the purpose of adjusting the tonality of a broadcast to prevent distortion caused by playback in a room with an undesirable frequency response.

11. **Claims 2 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Klayman in view of Fletcher.

Regarding **claim 2**, Klayman discloses all limitations of **claim 1** as applied above, but does not disclose nor render obvious the emulation of either an ear cupping or ear trumpet.

Fletcher provides equations which predict the frequency response of a trumpet horn of known dimensions (p. 192-193), which could be used by one of ordinary skill in the art at the time the invention was made to emulate the frequency response of such a horn (for example, an ear trumpet) using a multiband gain control method, such as is taught in Miller.

The references are combinable because each deals with the analysis and adjustment of audible sound. Fletcher further provides motivation to combine in disclosing the similarities between horn shapes and the pinna in animal ears including humans (Page 178, pages 200-201). Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the teachings of Fletcher to modify the teachings of Klayman in order to implement an amplifying system with multiband amplification that emulates an ear trumpet for the purpose of providing a close approximation to a human ear's frequency response in the system.

Regarding **claim 7**, this claim is very similar to **claim 2**, in that it includes the same limitation of **claim 2** and only further differs in the preamble from the base **claims**

1 and **6** as applied above. For these reasons, **claim 7** is rejected for the same reasons as applied to **claim 2**.

12. **Claims 3-4, 7 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Klayman in view of Fletcher and in further view of Miller.

Regarding **claim 3**, Klayman in view of Fletcher discloses all limitations of **claim 2** as applied above. Miller further discloses:

- a receiver to receive an input signal and to source therefrom the audio signal of the first and second frequency ranges (Fig. 1, element 40; Col. 3, lines 45-49);
- a generator to generate an injection tone (Fig. 1, element 22; Col. 2, lines 33-38, lines 46-47; Col. 4, lines 64-67);
- the mixer to combine the injection tone with the signals of the first and the second frequency ranges amplified by the respective first and the second amplifiers (Fig. 1, element 22; Col. 3, lines 34-36); and

It is noted by the examiner that Miller does not disclose the injection tone to be combined at the mixer, but instead with a separate masked sine wave adder.

It is further noted that one of ordinary skill in the art would recognize that modifying the masked sine wave adder to act as an additional input to mixer/preamplifier 24 would produce the same results with a reasonable expectation of success. A person of ordinary skill in the art, upon reading the teachings Miller, would also have recognized the motivation to modify exists because the masked sine wave adder 22 would then be accessible to allow manual control from the user to improve performance of tone detection in unexpected conditions. Furthermore, this modification is a known option within the technical grasp of one of ordinary skill in the art at the time the invention was made.

Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to make this modification to the teachings of Miller in order to allow manual control of the tone injection by the user to improve performance of the tone detection in unexpected conditions with reasonable expectation of success.

- the acoustic output device to transmit the amplified audio signal of the first and the second frequency ranges together with the injection tone (Fig. 1, element 34; Col. 3, lines 42-45); and
- a detector to recover a portion of the injection tone signal feedback and received by the receiver in the

input signal (Fig. 1, element 42; Col. 3, lines 49-52; Col. 5, lines 15-19);

- the second amplifier comprising an adjustable gain of a magnitude controlled dependent on the level of the injection tone signal recovered by the detector (Fig. 1, element 44; Col. 3, line 67 – Col. 4, line 06; Col. 5, lines 36-39).

The references are combinable because each is directed to enhancing an audio signal using multiple narrowband filters. Fletcher further provides motivation to combine in disclosing the similarities between horn shapes and the pinna in animal ears including humans and the utility of using said horn shapes to approximate the behavior of human ears (Page 178, pages 200-201). Miller further provides motivation to combine the references in disclosing the utility of inserting reference signals into output audio for detection in order to provide a reliable standard in analyzing the performance of a loudspeaker system (Col. 2, lines 33-45).

Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art to combine the teachings of Klayman, Fletcher and Miller in order to enhance an audio signal using multiple narrowband filters that is operable to emulate a horn shaped in order to approximate the behavior of human ears, and is further operable to insert a reference signal into output audio for detection in order to provide a reliable standard in analyzing the performance of a loudspeaker system.

Regarding **claim 4**, Klayman in view of Fletcher and in further view of Miller discloses all limitations of **claim 3** as applied above, and Miller further discloses that the generator [sine wave adder] is intended to inject a tone that is not audible [masked] (Col. 4, line 65 - Col. 5, line 15).

The limitations of **claim 12** are directly related to the teachings of Miller as applied above to **claim 11**. Therefore, the motivation to combine the references is the same for **claim 12** as applied above to **claim 11**.

Regarding **claim 14**, Klayman in view of Miller discloses or renders obvious all limitations of **claim 8** as applied above, but does not disclose nor render obvious the emulation of either an ear cupping or ear trumpet.

Fletcher provides equations which predict the frequency response of a trumpet horn of known dimensions (p. 192-193), which could be used by one of ordinary skill in the art at the time the invention was made to emulate the frequency response of such a horn (for example, an ear trumpet) using a multiband gain control method, such as is taught in Miller.

Further because **claim 8** claims subject matter very similar to that of **claim 1** and **claim 14** only provides limitations presented in **claim 2**, the motivation to combine the references with regard to **claims 2** and **8** is applicable to **claim 14**.

13. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Klayman in view of Miller in view of Fletcher and in further view of Munter.

Regarding **claim 5**, Klayman in view Miller in view of Fletcher discloses all limitations of **claim 3** as applied above, but does not adequately teach a predetermined modulation encoding or decoding for the injection tone signal.

Munter discloses a system of automatic gain control in a voice transmission circuit, such as a telephone system, that includes a inaudible control signal using pulse modulation (Col. 4, lines 05-12, lines 21-25, lines 31-34).

The references are combinable because each is directed to enhancing an audio signal using multiple narrowband filters. Fletcher further provides motivation to combine in disclosing the similarities between horn shapes and the pinna in animal ears including humans and the utility of using said horn shapes to approximate the behavior of human ears (Page 178, pages 200-201). Miller further provides motivation to combine the references in disclosing the utility of inserting references signals into output audio for detection in order to provide a reliable standard in analyzing the performance of a playback system (Col. 2, lines 33-45). Munter further provides motivation in disclosing the utility of identifiable pulse code modulated signals to prompt a third-party network system in order to automate the process for increased speed and accuracy (Col. 1, lines 18-25).

Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art to combine the teachings of Klayman, Fletcher and Miller in order to enhance an audio signal using multiple narrowband filters that is operable to emulate a horn shaped in order to approximate the behavior of human ears, and is further operable to insert a reference signal into output audio for detection in order to provide a reliable standard in analyzing the performance of a playback system, and is further still operable to utilize identifiable pulse code modulated signals to prompt a third-party network system in order to automate the process for increased speed and accuracy.

14. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Klayman in view of Miller and in further view of Munter (US Patent 4,539,692; cited previously).

Regarding **claim 9**, Miller discloses all limitations of **claim 8** as applied above, but does not disclose the modulation of the signal tone using at least one of pulse modulation and frequency modulation.

Munter discloses a system of automatic gain control in a voice transmission circuit, such as a telephone system, that includes a inaudible control signal using pulse modulation (Col. 4, lines 05-12, lines 21-25, lines 31-34).

The references are combinable because each is directed to each is directed to a system for transmitting and reproducing audio data with controllable gain. Miller further provides motivation to combine the references in disclosing the utility of inserting references signals into output audio for detection in order to provide a reliable standard

in analyzing the performance of a playback system (Col. 2, lines 33-45). Munter provides motivation in disclosing the utility of identifiable pulse code modulated signals to prompt a third-party network system in order to automate the process for increased speed and accuracy (Col. 1, lines 18-25).

Therefore, the examiner contends that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Klayman, Miller and Munter in order to implement a system for transmitting and reproducing audio data with controllable gain that is further operable to insert reference signals into the output audio for detection in order to provide a reliable standard in analyzing the performance of a playback system and is further operable to utilize identifiable pulse code modulated signals to prompt a third-party network system in order to automate the process for increased speed and accuracy.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Coulter (US Patent 3,872,250) teaches a method and system for speech compression.
- Kitamura (US Patent 3,975,763) teaches a signal time compression or expansion system including multiple voltage-controlled amplifiers.

- Odlen (US Patent 4,340,780) teaches a self-correcting audio equalizer.
- Crosby (US Patent 4,532,930) teaches a cochlear implant system for an auditory prosthesis.
- Pfeiffer (US Patent 4,618,985) teaches a speech synthesizer comprising independent channels for the first and second formants of output speech.
- Bares (US Patent 4,721,923) teaches a radio receiver speech amplifier circuit that selectively filters speech formants to prevent distortion and increase intelligibility.
- Allen (US Patent 4,905,285) teaches an analysis arrangement based on a model of human neural responses, including perception of speech.
- Chabries (US Patent 5,029,217) teaches a digital hearing enhancement apparatus that is operable to model desired hearing characteristics.
- von Wallenberg-Pachaly (US Patent 5,215,085) teaches a method and apparatus for electrical stimulation of the auditory nerve.
- Terry (US Patent 5,388,185) teaches a system for adaptive processing of telephone voice signals.
- Terry (US Patent 5,737,719) teaches a method and apparatus for enhancement of telephonic speech signals.
- Porayath (US Patent 5,999,631) teaches acoustic feedback elimination using an adaptive notch filter algorithm.
- Koski (US Patent 6,011,853) teaches equalization of a speech signal in a mobile phone.

- Licht (US PGPUB 2004/0057586) teaches a voice enhancement system including selective gain adjustment.
- Narusawa (US PGPUB 2004/0161128) teaches an amplification apparatus amplifying responses to particular frequencies in acoustic signals.

16. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Kovacek whose telephone number is (571)270-3135. The examiner can normally be reached on M-F 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626